

REMARKS

Claims 1-32 are pending. Claims 13-22 and 24 have been withdrawn from consideration. Applicant respectfully requests reconsideration and allowance of all pending claims of the application, after rejoinder of the withdrawn claims 13-22, in view of the following arguments.

Rejections under 35 U.S.C. § 103

Claims 1, 2, 6-8, 31 and 32 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gurusamy et al. (US 6,361,423) in view of Manfredi et al. et al. (US 5,785,585). Claims 3-5, 9-12, 23, and 25-30 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gurusamy et al. (US 6,361,423) in view of Manfredi et al. et al. (US 5,785,585) as applied to claim 1 above, and further in view of Sung (US 6,679,243). The Patent Office alleges:

'423 discloses the claimed invention, except for the carrier substantially contacting the entire contacting surface of the substrate, the substrate being adhered to the carrier or the substrate being permanently affixed to the carrier. ... It would have been obvious to one of ordinary skill in the art to have provided '289 with a carrier that substantially contacts the entire contacting surface of the substrate, as taught by '585, for the predictable result of increasing the contact surface area between the carrier and substrate, ensuring a better connection.¹

Applicant understands the Patent Office's reference to '289 in the above citation to be a reference to '423, or in the alternative, '423 as modified by '289 (US 5,683,289 to Hempel, Jr., of record), in view of the art cited in forming the basis of the rejection. Applicant respectfully notes that, in each instance, the Patent Office bases its rejection on the polishing pad conditioner of '423 (Gurusamy et al.), or in the alternative, '423 as modified by '289 (Hempel, Jr.).

With particular reference to claims 1-12, 23, and 25-30, Applicant respectfully disagrees with the Patent Office, for at least two reasons. First, Applicant respectfully contends that the Patent Office has failed to establish a proper *prima facie* case of obviousness of Applicant's claimed invention over the combination of '423 and '585, at least by failing to provide a ***proper motivation to combine the cited references***. The determination of obviousness must consider, *inter alia*, whether a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and whether there would have been a reasonable

¹ Office Action dated July 16, 2008, pp. 3-4, ¶ 4.

expectation of success in doing so.”² If the proposed combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no proper suggestion or motivation to make the combination.³ Applicant respectfully submits that the Patent Office’s proffered motivation to combine the references improperly renders the underlying invention of ‘423 unsatisfactory for its intended purpose.

Applicant respectfully contends that the teachings of Gurusamy et al. with Hempel, Jr. and those of Manfredi et al. are in clear conflict with respect to **whether the carrier may contact substantially the entire bottom substrate surface of the disk**, as Applicant claims. Furthermore, Applicant respectfully contends that the combination of Manfredi et al. with Gurusamy et al. and Hempel, Jr. would render the inventions of Gurusamy et al. and Hempel, Jr. unsuitable for their intended purpose. Applicant understands Gurusamy et al. (*see e.g.* FIG. 4, downwardly extending recess 220) and Hempel, Jr. (*see e.g.* FIG. 3, end effector recess 18) to each expressly disclose that a recess is formed between the carrier and the substrate to facilitate passage of the slurry, and thus, Hempel, Jr. and Gurusamy et al. each expressly teach that the **carrier does not contact substantially the entire bottom substrate surface**, in order to form recesses between the carrier and the substrate and thereby facilitate flow of the slurry radially outward along the upper surface of the disk through the channels (*see e.g.* 223 in Gurusamy et al. FIG. 4 and FIG. 10, and 248 in FIG. 10; *see also* 26 and arrows indicating slurry flow in Hempel, Jr. FIG. 3).

Applicant therefore respectfully submits that the Patent Office’s proffered motivation to combine the references to ensure a better connection improperly renders the underlying inventions of Gurusamy et al. (and Hempel, Jr.) unsatisfactory for their intended purpose. Applicant further submits that one of ordinary skill in the art would therefore not have been properly motivated to combine Gurusamy et al. and Hempel, Jr. with Manfredi et al. Thus, Applicant respectfully submits that the Patent Office has not met its burden of establishing a proper *prima facie* case of obviousness over the cited combination of references.

² See *Medichem S.A. v. Rolabo S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006); *Brown & Williamson Tobacco Corp. v. Phillip Morris, Inc.*, 229 F.3d 1120, 1124 (Fed. Cir. 2000).

³ See *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984).

In further support of this argument, Applicant respectfully contends that Gurusamy et al. and Hempel, Jr. **expressly teach away** from embodiments in which the carrier contacts substantially the entire bottom substrate surface of the disk, in order to achieve the advantages of “more efficient conditioning and cleaning of the disk during operation.”⁴ “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.”⁵ Gurusamy et al. expressly teaches that channels should be formed between the upper surface of the disk and the lower surface of the carrier in order to achieve the advantages of more efficient conditioning and cleaning of the disk during operation, as described with reference to the Figures, particularly FIG. 10:

The rotation of the disk may induce a flow 248 of the polishing slurry longitudinally upward from the lower surface 84 of the disk, through an array of holes 242 in the disk, and radially outward through the channels 223. **The flow proceeds outward through radially-extending passageways in the rim 210 formed by the recesses 220.** Each passageway/recess 220 is generally aligned with an associated end channel 223. This flow of the slurry may increase effectiveness of conditioning by helping to evacuate material from the pad surface.⁶

Gurusamy et al. also expressly teaches that “[t]he rotation of the disk may induce a flow 248 of the polishing slurry longitudinally upward from the lower surface 84 of the disk, through an array of holes 242 in the disk, and radially outward along the upper surface of the disk **through the channels 223.**”⁷

Applicant further understands Hempel, Jr. to expressly disclose that “[b]ase 16 includes end effector recess 18 for receiving end effector 20. The spacer mechanism for the present embodiment may be spacers 22 fit in end effector recess 18 and evenly space end effector 20 from the face of recess 18.”⁸ Further, “[a]s conditioning end effector 10 conditions CMP polish pad 40, slurry 38 passes through opening 26 of end effector 20.”⁹ In addition, Applicant understands both Hempel, Jr. and Gursamy et al. to disclose that a recess between the alleged

⁴ US Pat. No. 6,361,423 B2, col. 5, lines 50-59.

⁵ *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *Para-Ordnance Mfg. v. SGS Importers Int’l*, 73 F.3d 1085, 1090 (Fed. Cir. 1995).

⁶ US Pat. No. 6,361,423 B2, col. 12, lines 29-39 (*emphasis added*).

⁷ *Id.* (*emphasis added*).

⁸ US Pat. No. 5,683,289, col. 3, lines 59-63.

⁹ *Id.*, col. 4, lines 24-26.

substrate and the alleged carrier is essential in order to achieve the benefits associated with circulation of the slurry through openings in the faces of the respective end effectors. For example, Gurusamy et al. expressly discloses that “[t]his flow of the slurry may increase the effectiveness of conditioning by helping to evacuate material from the pad surface.”¹⁰

Furthermore, Hempel, Jr. expressly discloses:

[a]nother technical advantage that the present invention provides is a practical solution to the problem [of] slurry and semiconductor device particles forming deposits in openings of the end effector. The CMP polish pad end effector of the present invention permits complete flushing of the end effector openings. This cleans out potential slurry and particle deposits from the end effector openings. The result is an always fresh and clean end effector surface for conditioning the CMP pad.¹¹

Thus, Applicant respectfully submits that the alleged carriers of Hempel, Jr. and Gurusamy et al. are expressly disclosed as not contacting substantially the entire bottom substrate surface, as Applicant presently claims. Based on the express teachings of Gurusamy et al. and Hempel, Jr., Applicant respectfully submits that one of ordinary skill in the art would be discouraged from following the path set out in Manfredi et al., and therefore would be led in a direction divergent from the path that was taken by the Applicant, in which the carrier contacts substantially the entire bottom substrate surface of the disk. Applicant therefore submits that Gurusamy et al. and Hempel, Jr. **teach away** from the combination with Manfredi et al. to achieve the modification wherein the **carrier contacts substantially the entire bottom substrate surface**, as suggested by the Patent Office.

For at least the foregoing reasons, Applicant respectfully submits that one of ordinary skill in the art would at least not be properly motivated to modify Hempel, Jr. and/or Gurusamy et al. according to the teachings of Manfredi et al. et al., to obtain Applicant's presently claimed carrier that contacts substantially the entire bottom substrate surface. To do so would eliminate the beneficial effects of maintaining a recess between the alleged carrier and the alleged disk (substrate) expressly disclosed by Hempel, Jr. and Gurusamy et al. Applicant therefore respectfully submits that the Patent Office's proffered motivation to combine the references to ensure a better connection improperly renders the underlying inventions of Gurusamy et al. (and

¹⁰ US Pat. No. 6,361,423 B2, col. 12, lines 36-38.

¹¹ US Pat. No. 5,683,289, col. 3, lines 11-19.

Hempel, Jr.) unsatisfactory for their intended purpose. Thus, Applicant respectfully submits that the Patent Office has not met its burden of establishing a proper *prima facie* case of obviousness over the cited combination of references.

Second, Applicant respectfully contends that the Patent Office has failed to establish a proper *prima facie* case of obviousness of Applicant's claimed invention over the combination of '423 and '585, at least by failing to provide a proper combination of references that has a **reasonable expectation of success** in obtaining Applicant's claimed invention. Applicant respectfully contends that the Patent Office has improperly selected only those teachings from Gurusamy et al. Hempel, Jr., and Manfredi et al. that provide support for the Patent Office's argument, while ignoring other conflicting teachings or inconsistencies between the cited references. "In an obviousness rejection, it is impermissible 'to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.'"¹²

Applicant respectfully contends that the different shapes, different means of attachment, different mounting objectives, and even the different design objectives (e.g. flow of the polishing slurry radially outward along the upper surface of the disk through the channels as required by Gurusamy et al. and Hempel, Jr., versus no flow channels at all between the conditioning plate and roughened sheet of Manfredi et al.), all present significant technical obstacles to such modification. Applicant therefore respectfully submits that one of ordinary skill in the art would not have a reasonable expectation of success in combining Gurusamy et al. and Hempel, Jr. with Manfredi et al. to obtain Applicant's claimed invention, absent the teachings of Applicant's own disclosure.

Even if Manfredi et al. is only relied upon to teach or suggest modifying the disk holders and conditioning disks of Gurusamy et al. and Hempel, Jr. to permit the carrier to contact substantially the entire bottom substrate surface, as suggested by the Patent Office, there appears to be evidence missing in the record as to how one of ordinary skill in the art would be able to carry out such modification based on the substantial differences in design geometry and

¹² *Ex parte Ricci*, Appeal No. 2007-1307, p. 5 (BPAI October 22, 2007), quoting *In re Wesslau*, 353 F.2d 238, 241, 147 USPQ 391, 393 (CCPA 1965).

configuration between the generally cylindrical conditioning disks and disk holders of Gurusamy et al. with Hempel, Jr., and the wedge-shaped conditioning plates and holders of Manfredi et al. In view of the complete lack of evidence in the record regarding the level of ordinary skill in the art, and the paucity of evidence in the record related to how one of ordinary skill would overcome such technical obstacles to the proposed modification of Gurusamy et al. and Hempel, Jr., Applicant respectfully contends that the Patent Office has not met its evidentiary burden of establishing a proper *prima facie* case of obviousness.

Furthermore, Applicant believes that FIG. 2A, referenced by the Patent Office as allegedly disclosing that the alleged carrier (i.e. conditioning plate 40 in FIG. 2A) contacts substantially the entire bottom substrate surface (i.e. roughened sheet 44 in FIG. 2a), doesn't even show conditioning plate 40 in actual contact with roughened sheet 44. And, if the Patent Office is relying on the Figures to purportedly provide a disclosure that substantially the **entire surface** of alleged substrate 44 contacts the alleged carrier 40, then the Patent Office is respectfully reminded that "patent drawings do not define the precise proportions of the elements and may not be relied upon to show particular sizes if the specification is completely silent on the issue."¹³

In addition, Applicant has been unable to locate even a single textual reference within Manfredi et al. that clearly and unambiguously discloses or teaches that the alleged carrier (i.e. conditioning plate 40 in FIG. 2A) contacts substantially **the entire bottom substrate surface** (i.e. roughened sheet 44 in FIG. 2a), as Applicant claims. On the contrary, FIG. 2A makes clear that it is the **top surface of the alleged substrate 44** that **contacts the bottom surface of the alleged carrier 40**.

Thus, absent evidence of a specific disclosure, found within Manfredi et al., that expressly and undoubtedly discloses or teaches that the alleged carrier (i.e. conditioning plate 40 in FIG. 2A) must necessarily contact substantially the entire bottom substrate (i.e. 44 in FIG. 2a) surface, Applicant respectfully submits that the Patent Office has failed to carry its initial burden of establishing a proper *prima facie* case of obviousness, at least by failing to show, absent the improper application of hindsight analysis, that one of ordinary skill in the art would have had a

¹³ *Hockerson-Halberstadt, Inc. v. Avia Group International*, 222 F.3d 951, 55 USPQ2d 1487 (Fed. Cir. 2000).

reasonable expectation of success in arriving at Applicant's claimed invention, and further, that such combination includes all limitations of Applicant's claimed invention.

With particular reference to claims 31-32, the Patent Office agrees that the limitation "permanently affixed" in independent claim 31 is supported, but alleges that a "structure can be permanently affixed to another structure magnetically dependent on the strength of the magnetic force."¹⁴ Applicant respectfully contends that the Patent Office has at least failed to meet its burden of establishing that any of Hempel, Jr., Gurusamy et al., Sung, and now Mamfredi et al., disclose, teach or suggest a **carrier permanently affixed to the bottom surface of a substrate**, as Applicant presently claims.

As a threshold matter, Applicant respectfully contends that the Patent Office still has not properly met its burden of showing that magnets may be used to permanently affix a structure to another dependent on the strength of the magnetic force. If the Patent Office disagrees, then the Examiner is respectfully invited to provide, on the record, a reference that provides such a teaching or disclosure, citing with particularity to page and line number where such a teaching or disclosure is provided.

Additionally, Applicant respectfully contends that it is irrelevant whether magnets can be used to permanently affix one structure to another. What is relevant is whether the cited combinations of references disclose, teach or suggest use of magnets, or other means, to permanently affix a carrier to the bottom surface of a substrate wherein said carrier comprises at least one of synthetic plastic or ceramic, as Applicant presently claims. Applicant respectfully submits that the Patent Office has failed to properly establish, on the record, that Hempel, Jr., Gurusamy et al. and/or Sung disclose, teach or suggest a carrier permanently affixed to the bottom surface of a substrate, as required to establish a proper *prima facie* case of obviousness.

Furthermore, while use of an adhesive tape to non-permanently affix an end effector to a lower substrate surface may be conventional with Hempel, Jr.'s end effector (FIG. 3) wherein the slurry passes through openings 26 of end effector 20 into end effector recess 18, such disclosure cannot make obvious Applicant's presently claimed carrier permanently affixed to the bottom surface of a substrate without creating a recess or void between the carrier and the bottom

¹⁴ Office Action dated January 8, 2008, p. 6, ¶ 7.

surface of the substrate that would allow slurry to penetrate and weaken an adhesive joint.¹⁵ In fact, Applicant respectfully contends that Hempel, Jr. expressly teaches away from Applicant's use of an adhesive to permanently affix the alleged carrier (end effector 20) to the bottom surface of a substrate (recess face 368).¹⁶

In addition, Gurusamy et al. expressly discloses that the alleged carrier is **not permanently affixed to the alleged substrate** in each instance in order to obtain the advantages associated with having "a disk holding element which is made readily removable from the backing element and from the disk,"¹⁷ and thus expressly teaches away from Applicant's claimed invention. Gurusamy et al. expressly teaches that the alleged carrier (disk holding element 158) is not permanently affixed to the alleged substrate (disk 82), and further states that "[a] further advantage is provided by a disk holding element which is made readily removable from the backing element and from the disk."¹⁸

Furthermore, Applicant respectfully contends that even if, *arguendo*, one of ordinary skill in the art was motivated to modify the disk holder of Gurusamy et al. or Hempel, Jr. based upon the teachings of Manfredi et al., such modification would inevitably defeat the advantages sought by Gurusamy et al. and Hempel, Jr. resulting from circulation of the slurry through openings in the faces of the respective end effectors, as noted above. Thus, on the record before us, it appears that the Patent Office has relied upon impermissible hindsight¹⁹ in piecing together selectively chosen teachings, including Applicant's own disclosure, to arrive at Applicant's claimed invention. For at least these reasons, reconsideration and withdrawal of the rejection of claims 31-32 is respectfully requested.

In addition to the foregoing, Applicant submits that a dependent claim should be allowed when its parent claim is allowed.²⁰ Claims 2-12, 14-22 (withdrawn), 24-30, and 32 respectively depend from independent claims 1, 13 (withdrawn), 23, and 31. Accordingly, when independent claims 1, 13, 23, and 31 are allowed, all claims depending therefrom should also be allowed.

¹⁵ See US Pat. No. 5,683,289, col. 5, lines 1-7.

¹⁶ *Id.*, col. 3, lines 25-30; and col. 5, lines 26-29.

¹⁷ US Pat. No. 6,361,423 B2, col. 5, line 60 through col. 6, lines 8.

¹⁸ *Id.*, col. 5, lines 60-63.

¹⁹ See *Ex parte So and Thomas*, BPAI Appeal No. 2007-3967 (January 4, 2008).

²⁰ *In re McCarn*, 101 U.S.P.Q. 411 (CCPA 1954).

CONCLUSION

For all of the foregoing reasons, the Patent Office has not met its burden of showing that the prior art makes obvious Applicant's presently claimed invention. Thus, Applicant respectfully submits that the rejection of claims 1-12, 23, and 25-32 under 35 U.S.C. § 103(a) as allegedly being unpatentable as purportedly obvious over the cited references has been overcome and should be withdrawn. Other reasons for withdrawal of the rejections also exist.

Furthermore, withdrawn independent claim 13, from which claims 14-22 depend, was previously amended to require all limitations of allowable independent claim 1. Dependent claim 24 depends from allowable independent claim 23. Applicant respectfully contends that claims 13-22 and 24 differ from the allowable claims only with respect to the limitation that the carrier comprises polycarbonate, and that a polycarbonate carrier is a species falling within the scope of the allowable generic linking claims 1 and 23. Applicant timely traversed the restriction (election) requirement in its reply dated January 18, 2005. Therefore, Applicant respectfully requests reconsideration, rejoinder and allowance of claims 13-22 and 24 under 37 CFR 1.104.

In view of the above, it is submitted that the application is in condition for allowance. Allowance of all pending claims at an early date is solicited. The Examiner is invited to contact Applicant's attorney to resolve any remaining questions.

Respectfully submitted,

September 16, 2008
Date

By: /James A. Baker/
James A. Baker, Reg. No.: 44,520
Telephone No.: 651-736-9667

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833